

From VPH-Share to PL-Grid: Atmosphere as an Advanced Frontend to Cloud Resources in Research Infrastructures



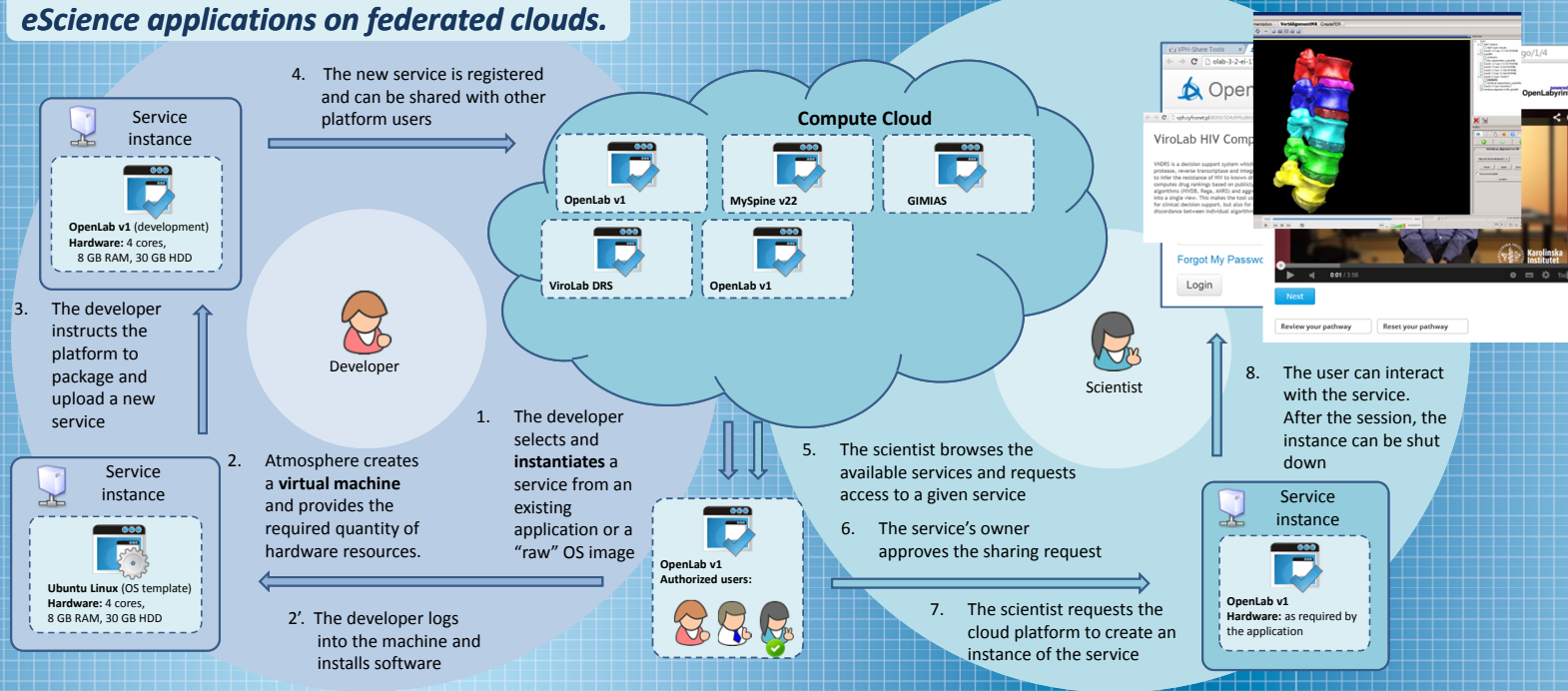
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Atmosphere is a platform for developers and end users, supporting efficient development and execution of eScience applications on federated clouds.



Scientific objectives

- Research on cloud computing model for complex scientific applications
- Resource management for services on heterogeneous resources
- Billing and accounting models for cloud computing
- Procedural and technical aspects of efficient and secure data storage, transfer and processing
- Component dependency management, composition and deployment

Applications

- @neurIST – simulation of cerebral aneurysms
- ViroLab – HIV therapy decision support system
- MySpine – lumbar spine simulation
- EUHeart – cardiovascular modeling
- Virtual Patients for medical education
- ARTreat – artherosclerosis simulation
- VPH-DARE@IT – dementia research

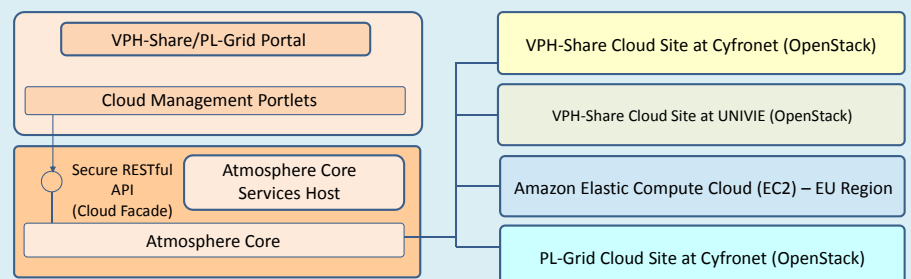
Features of Atmosphere

- A layer of abstraction over cloud-based virtual machines
- A way to port scientific applications to the cloud
- Automatic selection of the best hardware resources to deploy applications
- Automatic load balancing allows applications to scale up as needed
- VM image synchronization for hybrid clouds
- A billing model for commercial clouds
- Integration with Taverna, HyperFlow, Pumpkin
- Applications supported:
 - Linux-based SOAP/REST services
 - Web applications
 - rich GUI clients running under MS Windows
- Integration with the VPH and PL-Grid ecosystem:
 - authentication, authorization, sharing
 - data management

Atmosphere in numbers

- Over 130 services registered
- More than 200 virtual machine templates
- 100+ registered users from VPH community
- 30% of users with developer access
- 50–100 service instances run daily
- 1000 requests for instance creation per month
- VM lifetime from 15 minutes to over 30 days

Hybrid Cloud Platform



References

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- M. Malawski, T. Gubała, M. Bubak: *Component-based Approach for Programming and Running Scientific Applications on Grids and Clouds*. The International Journal of High Performance Computing Applications, 26(3) 275-295: 2012

